

# CLAIMS

1. A differential surface plasmon resonance measuring apparatus comprising:

(a) an incident light optical system, wherein light enters at an incident angle in a range including the resonance angle;

(b) a sample setting device including a sample solution-fixing portion and a reference solution-fixing portion on a thin film deposited on a prism, the sample solution-fixing portion and the reference solution-fixing portion lying in the region irradiated with a beam of the incident light;

(c) a projection optical system for splitting light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on a single line; and

(d) a liner CCD sensor including a CCD on the single line, the CCD receiving the beams.

2. The differential surface plasmon resonance measuring apparatus according to Claim 1, wherein the projection optical system includes a plurality of mirrors for splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to

project the beams on the single line.

3. The differential surface plasmon resonance measuring apparatus according to Claim 2, wherein the plurality of mirrors include a first mirror for reflecting the reflected light from the sample solution-fixing portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle.

4. The differential surface plasmon resonance measuring apparatus according to Claim 1, further comprising an adhesive optical interface film disposed on the prism, the optical interface film having a refractive index matched with the refractive index of the prism.

5. A method for differentially measuring surface plasmon resonance, the method comprising: emitting light from a light source having a specific wavelength so as to form a line focus on a sensor including a prism and a glass substrate; generating surface plasmon resonances at sensing portions of a sample cell and a reference cell that are provided on the line focus at a predetermined distance to reduce the intensity of the light reflected from the sensing portions; allowing the beams of the reflected light to reflect from light-splitting mirrors having different angles with the beams maintaining a distance equal to the predetermined distance between the centers of the sensing portions and thus splitting the reflected light into two

optical paths; and pressing an electrode-type combination sensor cell including sensing films corresponding to the sample portion and the reference portion on an adhesive optical interface film disposed on the prism, having a refractive index matched with that of the prism, whereby an optical system performing detection in two regions of a single CCD line sensor measures the surface plasmon resonances generated in the sample cell and the reference cell, with optical matching maintained between the sensor, the optical interface film, and the prism.

6. The method for differentially measuring surface plasmon resonance according to Claim 5, wherein the optical interface film is a polymeric adhesive optical interface film.

7. The method for differentially measuring surface plasmon resonance according to Claim 6, wherein the polymeric film comprises polyvinyl chloride.

8. The method for differentially measuring surface plasmon resonance according to Claim 6 or 7, wherein the sample cell is disposed on the adhesive optical interface film without using a matching oil having the same refractive index as the prism and the glass substrate.

9. The method for differentially measuring surface plasmon resonance according to Claim 8, wherein a substance interactive with a functional material and having a

refractive index that is varied by the interaction is measured in a chemical sensor-like system.

10. The method for differentially measuring surface plasmon resonance according to Claim 9, wherein an antibody is fixed to the sample cell so that an antigen-antibody reaction is measured in an immunosensor-like system.

11. The method for differentially measuring surface plasmon resonance according to Claim 5, wherein the electrode-type combination sensor cell is pressed at a force of about 20 N.